International Journal of

HYDROGEN ENERGY

Editor-in-Chief
T. NEJAT VEZIROĞLU

Associate Editors
F. BARBIR, J. W. SHEFFIELD

Honorary Editorial Board
H. K. ABDEL-AAL, L. A. AVACA, R. E. BILLINGS, D. L. BLOCK, J. O'M. BOCKRIS, W. J. D. ESCHER, D. FRUCHART, J. E. FUNK, V. A. GOLTSOV, D. P. GREGORY, S. KAKAÇ, G. A. KARIM, K. F. KNOCHE, P. LEHMAN, F. A. LEWIS, C. MARCHETTI, T. OHTA, J. POTTIER, V. D. RUSANOV, D. S. SCOTT, W. SEIFRITZ, M. STEINBERG, P. K. TAKAHASHI, H. VANDENBORRE, W. D. VAN VORST, A. K. VIJH, C.-J. WINTER

Editorial Board
S. BADWAL, L. D. BERTRAND, P. CHENG, N. DJILALI, J. GARCHE, E. R. GONZALEZ, K. KENDALL, J. KILNER, C.-S. KIM, X. LI, H. LIU, K. LIU, R. MALLANT, S. P. MALYSHENKO, N. MURADOV, K.-I. OTA, A. RAISSI, T. R. RALPH, N. M. SAMMES, O. SAVADOGO, K. SCOTT, P. J. SEBASTIAN, O. N. SRIVASTAVA, H. UCHIDA, F. A. URIBE, O. ULLEBERG, J. W. VAN ZEE, C.-Y. WANG, Y. YURUM

Volume 29, 2004

Volume Contents and Author Index

ELSEVIER

International Journal of
HYDROGEN ENERGY

Official Journal of the International Association for Hydrogen Energy

AIMS AND SCOPE

This is the official journal of the International Association for Hydrogen Energy. It aims to provide a central vehicle for exchange and dissemination of basic ideas in the field of hydrogen energy between research scientists and engineers throughout the world. The emphasis will be placed on original research, both analytical and experimental, of permanent interest to engineers and scientists in various aspects of hydrogen energy, namely production, storage, transmission, utilization, as well as the economical, environmental and international aspects.

When outstanding new advances are made in existing areas of hydrogen energy, or when new areas have been developed to a definitive stage, special review articles will be considered.

To encourage exchange of ideas, a section of the Journal will be devoted to discussion of previously published papers. Shorter communications are also invited and should not exceed 1500 words.

As a service to our readers an international bibliography of recent publications in hydrogen energy listed by title, author and source will appear quarterly in the Journal.

© 2004 International Association for Hydrogen Energy. All rights reserved

It is a condition of publication that manuscripts submitted to this journal have not been published and will not be simultaneously submitted or published elsewhere. By submitting a manuscript, the authors agree that the copyright for their article is transferred to the IAHE if and when the article is accepted for publication. However, assignment of copyright is not required from authors who work for organizations which do not permit such assignment. The copyright covers the exclusive rights to reproduce and distribute the article, including reprints, photographic reproductions, microform or any other reproductions of similar nature and translations. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, electrostatic, magnetic tape, mechanical, photocopying, recording or otherwise, without permission in writing from the copyright holder.

Photocopying information for users in the U.S.A.

The Item-fee Code for this publication indicates that authorization to photocopy items for internal or personal use is granted by the copyright holder for libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service provided the stated fee for copying beyond that permitted by Section 107 or 108 of the United States Copyright Law, is paid. The appropriate remittance of $30.00 per copy per article is paid directly to the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, U.S.A.

Permission for other use

The copyright owner's consent does not extend to copying for general distribution, for promotion, for creating new works, or for resale. Specific written permission must be obtained from the publisher and the IAHE for such copying.

Whilst every effort is made by the publishers and editorial board to see that no inaccurate or misleading data, opinion or statement appears in this journal, they wish to make it clear that the data and opinions appearing in the articles and advertisements herein are the sole responsibility of the contributor or advertiser concerned. Accordingly the publishers, the editorial board and editors and their respective employees, officers and agents accept no responsibility or liability whatsoever for the consequences of any such inaccurate or misleading data, opinion or statement.

⊘ The paper used in this publication meets the requirements of ANSI/NISO Z39.48–1992 (Permanence of Paper)

The Item-fee Code for this publication is: 0360-3199/02 $30.00 + 0.00

CONTENTS OF VOLUME 29

NUMBER 1

Editorial
T.N. VEZIROGLU 15 IJHE thrust toward meeting the needs of implementation

D.S. SCOTT 17 Template For Sustainability

B. SØRENSEN, A.H. PETERSEN, C. JUHL, H. RAVN, C. SØNDERGREN, P. SIMONSEN, K. JØRGENSEN, L.H. NIELSEN, H.V. LARSEN, P.E. MORTHORST, L. SCHLEISNER, F. SØRENSEN and T.E. PEDERSEN 23 Hydrogen as an energy carrier: scenarios for future use of hydrogen in the Danish energy system

F.-Y. CHANG and C.-Y. LIN 33 Biohydrogen production using an up-flow anaerobic sludge blanket reactor

C.Y. LIN and C.H. LAY 41 Carbon/nitrogen-ratio effect on fermentative hydrogen production by mixed microflora

D. HIRSCH and A. STEINFELD 47 Solar hydrogen production by thermal decomposition of natural gas using a vortex-flow reactor

J.K. DAHL, A.W. WEIMER and W.B. KRANTZ 57 Sensitivity analysis of the rapid decomposition of methane in an aerosol flow reactor

F. MARIÑO, M. BOVERI, G. BARONETTI and M. LABORDE 67 Hydrogen production via catalytic gasification of ethanol. A mechanism proposal over copper–nickel catalysts

C.X. SHANG, M. BOUOUDINA, Y. SONG and Z.X. GUO 73 Mechanical alloying and electronic simulations of (MgH_2 + M) systems (M = Al, Ti, Fe, Ni, Cu and Nb) for hydrogen storage

X. YU, Z. WU, T. HUANG, J. CHENG, B. XIA and N. XU 81 Effect of surface oxide layer on activation performance of hydrogen storage alloy $TiMn_{1.25}Cr_{0.25}$

J.S. KIM, S.Y. OH, G. LEE, Y.M. KOO, S.E. KULKOVA and V.E. EGORUSHKIN 87 Theoretical study of the electronic structure and hydrogen adsorption properties in B2-TiFe thin films with Pd coating

G.E. FERNANDEZ, S.A. SEREBRINSKY, J.L. GERVASONI and J.P. ABRIATA 93 Calculation of the pressure dependence of the bulk modulus using a jellium model

D. LUPU, A.R. BIRIŞ, I. MIŞAN, A. JIANU, G. HOLZHÜTER and E. BURKEL 97 Hydrogen uptake by carbon nanofibers catalyzed by palladium

D. DAS and M.R. GOPAL 103 Studies on a metal hydride based solar water pump

Announcements

113 15th World Hydrogen Energy Conference

114 The International German Hydrogen Energy Congress 2004

115 3rd Fuel Cell Topical Conference

116 17th International Conference on Efficiency, Costs, Optimization, Simulation and Environmental Impact of Energy and Process Systems

117 The 4th International Conference "Hydrogen Treatment of Materials" (HTM-2004)

118 Solar Hydrogen Energy

119 International Association for Hydrogen Energy

NUMBER 2

D.S. SCOTT 121 The Tyranny Of Surprise

R.S. CHERRY 125 A hydrogen utopia?

Y.S. CHAUDHARY, A. AGRAWAL, R. SHRIVASTAV, V.R. SATSANGI and S. DASS 131 A study on the photoelectrochemical properties of copper oxide thin films

C.-C. YANG 135 Preparation and characterization of electrochemical properties of air cathode electrode

B. ŁOSIEWICZ, A. BUDNIOK, E. RÓWIŃSKI, E. ŁĄGIEWKA and A. LASIA 145 The structure, morphology and electrochemical impedance study of the hydrogen evolution reaction on the modified nickel electrodes

Y. TOMONOU and Y. AMAO 159 Effect of micellar species on photoinduced hydrogen production with Mg chlorophyll-*a* from *spirulina* and colloidal platinum

E. EROĞLU, U. GÜNDÜZ, M. YÜCEL, L. TÜRKER and İ. EROĞLU 163 Photobiological hydrogen production by using olive mill wastewater as a sole substrate source

D.B. LEVIN, L. PITT and M. LOVE 173 Biohydrogen production: prospects and limitations to practical application

M.H. KIM, E.K. LEE, J.H. JUN, S.J. KONG, G.Y. HAN, B.K. LEE, T.-J. LEE and K.J. YOON 187 Hydrogen production by catalytic decomposition of methane over activated carbons: kinetic study

F. ASKRI, A. JEMNI and S.B. NASRALLAH 195 Prediction of transient heat and mass transfer in a closed metal–hydrogen reactor

Y. ASAKUMA, S. MIYAUCHI, T. YAMAMOTO, H. AOKI and T. MIURA — 209 — Homogenization method for effective thermal conductivity of metal hydride bed

Announcements

217 — 15th World Hydrogen Energy Conference

218 — The International German Hydrogen Energy Congress 2004

219 — 3rd Fuel Cell Topical Conference

220 — 17th International Conference on Efficiency, Costs, Optimization, Simulation and Environmental Impact of Energy and Process Systems

221 — The 4th International Conference "Hydrogen Treatment of Materials" (HTM-2004)

222 — Solar Hydrogen Energy

223 — International Association for Hydrogen Energy

NUMBER 3

D.S. SCOTT — 225 — Hydrogen—the case for inevitability

W.-W. SO, K.-J. KIM and S.-J. MOON — 229 — Photo-production of hydrogen over the CdS–TiO_2 nano-composite particulate films treated with $TiCl_4$

M. HENRIQUE DOS SANTOS ANDRADE, M.L. ACIOLI, J. GINALDO DA SILVA JÚNIOR, J.C.P. SILVA, E.O. VILAR and J. TONHOLO — 235 — Preliminary investigation of some commercial alloys for hydrogen evolution in alkaline water electrolysis

Q. HAN, K. LIU, J. CHEN, X. LI and X. WEI — 243 — Study of amorphous Ni–S–Co alloy used as hydrogen evolution reaction cathode in alkaline medium

F.C. CRNKOVIC, S.A.S. MACHADO and L.A. AVACA — 249 — Electrochemical and morphological studies of electrodeposited Ni–Fe–Mo–Zn alloys tailored for water electrolysis

E.B. CASTRO, S.G. REAL and L.F. PINHEIRO DICK — 255 — Electrochemical characterization of porous nickel–cobalt oxide electrodes

J.-H. KIM, H. LEE, S.-C. HAN, H.-S. KIM, M.-S. SONG and J.-Y. LEE — 263 — Production of hydrogen from sodium borohydride in alkaline solution: development of catalyst with high performance

T. KIDA, G. GUAN, N. YAMADA, T. MA, K. KIMURA and A. YOSHIDA — 269 — Hydrogen production from sewage sludge solubilized in hot-compressed water using photocatalyst under light irradiation

C.-Y. LIN and C.H. LAY 275 Effects of carbonate and phosphate concentrations on hydrogen production using anaerobic sewage sludge microflora

W. MÉRIDA, P.-C. MANESS, R.C. BROWN and D.B. LEVIN 283 Enhanced hydrogen production from indirectly heated, gasified biomass, and removal of carbon gas emissions using a novel biological gas reformer

U. BALACHANDRAN, T.H. LEE, S. WANG and S.E. DORRIS 291 Use of mixed conducting membranes to produce hydrogen by water dissociation

Y. LIU, H. PAN, M. GAO, Y. ZHU, Y. LEI and Q. WANG 297 The effect of Mn substitution for Ni on the structural and electrochemical properties of $La_{0.7}Mg_{0.3}Ni_{2.55-x}Co_{0.45}Mn_x$ hydrogen storage electrode alloys

C. KHALDI, H. MATHLOUTHI, J. LAMLOUMI and A. PERCHERON-GUÉGAN 307 Electrochemical study of cobalt-free AB_5-type hydrogen storage alloys

Y. ZHU, H. PAN, M. GAO, Y. LIU, R. LI, Y. LEI and Q. WANG 313 Degradation mechanisms of Ti–V-based multiphase hydrogen storage alloy electrode

L. ZHOU, Y. ZHOU and Y. SUN 319 Enhanced storage of hydrogen at the temperature of liquid nitrogen

Z. ZHOU, K. KATO, T. KOMAKI, M. YOSHINO, H. YUKAWA and M. MORINAGA 323 Effects of hydrogen doping through ion implantation on the electrical conductivity of ZnO

Announcements

329 15th World Hydrogen Energy Conference

330 The International German Hydrogen Energy Congress 2004

331 3rd Fuel Cell Topical Conference

332 17th International Conference on Efficiency, Costs, Optimization, Simulation and Environmental Impact of Energy and Process Systems

333 The 4th International Conference "Hydrogen Treatment of Materials" (HTM-2004)

334 Solar Hydrogen Energy

335 International Association for Hydrogen Energy

NUMBER 4

T. KOSUGI, A. HAYASHI and K. TOKIMATSU 337 Forecasting development of elemental technologies and effect of R&D investments for polymer electrolyte fuel cells in Japan

T. Oi and K. Wada 347 Feasibility study on hydrogen refueling infrastructure for fuel cell vehicles using the off-peak power in Japan

W. Feng, S. Wang, W. Ni and C. Chen 355 The future of hydrogen infrastructure for fuel cell vehicles in China and a case of application in Beijing

G.J. Suppes, S. Lopes and C.W. Chiu 369 Plug-in fuel cell hybrids as transition technology to hydrogen infrastructure

S.L. Douvartzides, F.A. Coutelieris, A.K. Demin and P.E. Tsiakaras 375 Electricity from ethanol fed SOFCs: the expectations for sustainable development and technological benefits

Y.M. Ferng, Y.C. Tzang, B.S. Pei, C.C. Sun and A. Su 381 Analytical and experimental investigations of a proton exchange membrane fuel cell

J. R. Lattner and Michael P. Harold 393 Comparison of conventional and membrane reactor fuel processors for hydrocarbon-based PEM fuel cell systems

D.K. Liguras, K. Goundani and X.E. Verykios 419 Production of hydrogen for fuel cells by catalytic partial oxidation of ethanol over structured Ru catalysts

A. Luengnaruemitchai, S. Osuwan and E. Gulari 429 Selective catalytic oxidation of CO in the presence of H_2 over gold catalyst

437 News and Views

Announcements

441 15th World Hydrogen Energy Conference

442 Renewables 2004

443 17th International Conference on Efficiency, Costs, Optimization, Simulation and Environmental Impact of Energy and Process Systems

444 Photoenergy Center, Faculty of Science, Ain Shams University, Abbassia, Cairo, Egypt

445 The 4th International Conference "Hydrogen Treatment of Materials" (HTM-2004)

446 Solar Hydrogen Energy

447 International Association for Hydrogen Energy

NUMBER 5

D.S. Scott 449 For Better Or Worse?

B. Liu, H. Yuan and Y. Zhang 453 Impedance of Al-substituted α-nickel hydroxide electrodes

C.J. STEPHANSON and G.P. FLANAGAN 459 Non-toxic hydride energy source for biochemical and industrial venues: ORP and NAD^+ reduction analyses

C. GU, G.-H. GAO and Y.-X. YU 465 Density functional study of the adsorption and separation of hydrogen in single-walled carbon nanotube

L. ZHOU, Y. ZHOU and Y. SUN 475 A comparative study of hydrogen adsorption on superactivated carbon versus carbon nanotubes

Q. ZHENG, A. GU, X. LU and W. LIN 481 Temperature-dependent state of hydrogen molecules within the nanopore of multi-walled carbon nanotubes

M. GÜVENDIREN, E. BAYBÖRÜ and T. ÖZTÜRK 491 Effects of additives on mechanical milling and hydrogenation of magnesium powders

S.A. SEREBRINSKY and J.L. GERVASONI 497 Density of states induced by a hydrogenic impurity in a metal

U.A. RAJENDRA PRASAD, M. PRAKASH MAIYA and S. SRINIVASA MURTHY 501 Metal hydride water pumping system for low head-high discharge applications

R. PARIMALA, M.V. ANANTH, S. RAMAPRABHU and M. RAJU 509 Effect of electroless coating of Cu, Ni and Pd on $ZrMn_{0.2}V_{0.2}Fe_{0.8}Ni_{0.8}$ alloy used as anodes in Ni-MH batteries

Y.K. VIJAY, N.K. ACHARYA, S. WATE and D.K. AVASTHI 515 Characterization of track etched membranes by gas permeation

H.-M. YEH 521 Recovery of deuterium from water–isotopes mixture in concentric-tube thermal diffusion columns inserted with wire spiral for improved performance

T. OHTA 529 Life cycle of cavitation bubble for the nuclear emission

M.L. NEELIS, H.J. VAN DER KOOI and J.J.C. GEERLINGS 537 Exergetic life cycle analysis of hydrogen production and storage systems for automotive applications

S.P. CICCONARDI, A. PERNA and G. SPAZZAFUMO 547 Steam power-plants fed by high pressure electrolytic hydrogen

Announcements

553 15th World Hydrogen Energy Conference

554 Renewables 2004

555 Photoenergy Center, Faculty of Science, Ain Shams University, Abbassia, Cairo, Egypt

556 The First Cappadocia International Mechanical Engineering Symposium

557 Solar Power from Space/SPS '04

558 ISMF'05

559 The 4th International Conference "Hydrogen Treatment of Materials" (HTM-2004)

560 Solar Hydrogen Energy

561 International Association for Hydrogen Energy

NUMBER 6

D.S. SCOTT 563 Okay! But Now Tell Me About Cost

S.-K. HAN and H.-S. SHIN 569 Biohydrogen production by anaerobic fermentation of food waste

S. KASAHARA, S. KUBO, K. ONUKI and M. NOMURA 579 Thermal efficiency evaluation of HI synthesis/concentration procedures in the thermochemical water splitting IS process

S.P. MALYSHENKO, A.N. GRYAZNOV and N.I. FILATOV 589 High-pressure H_2/O_2-steam generators and their possible applications

Q. HAN, J. CHEN, K. LIU, X. LI and X. WEI 597 The heat-treatment effect of amorphous Ni–S(La) electrode on the hydrogen evolution reaction in an alkaline media

B. CHI, J. LI, Y. HAN and Y. CHEN 605 Effect of temperature on the preparation and electrocatalytic properties of a spinel $NiCo_2O_4$/Ni electrode

F. GALLUCCI, L. PATURZO and A. BASILE 611 A simulation study of the steam reforming of methane in a dense tubular membrane reactor

S. FUKADA, N. NAKAMURA and J. MONDEN 619 Effects of temperature, oxygen-to-methane molar ratio and superficial gas velocity on partial oxidation of methane for hydrogen production

D. TROMMER, D. HIRSCH and A. STEINFELD 627 Kinetic investigation of the thermal decomposition of CH_4 by direct irradiation of a vortex-flow laden with carbon particles

F. ASKRI, A. JEMNI and S. BEN NASRALLAH 635 Dynamic behavior of metal–hydrogen reactor during hydriding process

S. SIMONETTI, L. MORO, N.E. GONZALEZ, G. BRIZUELA and A. JUAN 649 Quantum chemical study of C and H location in an fcc stacking fault

L.C. DE LIMA, J.B.F. DUARTE and T.N. VEZIROGLU 659 A proposal of an alternative route for the reduction of iron ore in the eastern Amazonia

A.K. VIJH 663 Electrochemical treatment (ECT) of cancerous tumours: necrosis involving hydrogen cavitation, chlorine bleaching, pH changes, electroosmosis

Announcements

667 15th World Hydrogen Energy Conference

668 Renewables 2004

669 17th International Conference on Efficiency, Costs, Optimization, Simulation and Environmental Impact of Energy and Process Systems

670 The First Cappadocia International Mechanical Engineering Symposium

671 Solar Power from Space/SPS '04

672 International Hyrogen Energy Congress and Exibition

673 Photoenergy Center, Faculty of Science, Ain Shams University, Abbassia, Cairo, Egypt

674 Solar Hydrogen Energy

675 International Association for Hydrogen Energy

NUMBER 7

I. SCHULTE, D. HART and R. VAN DER VORST 677 Issues affecting the acceptance of hydrogen fuel

Z. YUMURTACI and E. BILGEN 687 Hydrogen production from excess power in small hydroelectric installations

Y. SAIKI and Y. AMAO 695 Visible light-induced enzymatic hydrogen production from oligosaccharides using Mg chlorophyll-*a* and platinum colloid conjugate system

Y. MATSUMURA and T. MINOWA 701 Fundamental design of a continuous biomass gasification process using a supercritical water fluidized bed

M. MORIMOTO, M. ATSUKO, A.A.Y. ATIF, M.A. NGAN, A. FAKHRU'L-RAZI, S.E. IYUKE and A.M. BAKIR 709 Biological production of hydrogen from glucose by natural anaerobic microflora

C.-Y. LIN and R.-C. CHANG 715 Fermentative hydrogen production at ambient temperature

T. AKIYAMA, A. MIYAZAKI, H. NAKANISHI, M. HISA and A. TSUTSUMI 721 Thermal and gas analyses of the reaction between iron carbide and steam with hydrogen generation at 573 K

J.K. DAHL, K.J. BUECHLER, A.W. WEIMER, A. LEWANDOWSKI and C. BINGHAM 725 Solar-thermal dissociation of methane in a fluid-wall aerosol flow reactor

H. CHI, C. CHEN, L. CHEN, Y. AN and Q. WANG 737 Hydriding/dehydriding properties of $La_2Mg_{16}Ni$ alloy prepared by mechanical ball milling in benzene and under argon

X. CHEN, Y. ZHANG, X.P. GAO, G.L. PAN, X.Y. JIANG, J.Q. QU, F. WU, J. YAN and D.Y. SONG 743 Electrochemical hydrogen storage of carbon nanotubes and carbon nanofibers

Y. XU 749 The electrochemical behavior of Ni–MH battery, $Ni(OH)_2$ electrode and metal hydride electrode

H. JANSSEN, J.C. BRINGMANN, B. EMONTS and V. SCHROEDER 759 Safety-related studies on hydrogen production in high-pressure electrolysers

G. BIRGISSON ESQ. and W. LAVARCO ESQ. 771 An effective regulatory regime for transportation of hydrogen

Announcements

781 15th World Hydrogen Energy Conference

782 17th International Conference on Efficiency, Costs, Optimization, Simulation and Environmental Impact of Energy and Process Systems

783 The First Cappadocia International Mechanical Engineering Symposium

784 Solar Power from Space/SPS '04

785 International Hyrogen Energy Congress and Exibition

786 Photoenergy Center, Faculty of Science, Ain Shams University, Abbassia, Cairo, Egypt

787 ISMF '05

788 Solar Hydrogen Energy

789 International Association for Hydrogen Energy

NUMBER 8

J.-M. HU, J.-Q. ZHANG and C.-N. CAO 791 Oxygen evolution reaction on IrO_2-based DSA® type electrodes: kinetics analysis of Tafel lines and EIS

M.E.E. ABASHAR 799 Coupling of steam and dry reforming of methane in catalytic fluidized bed membrane reactors

A.E. LUTZ, R.W. BRADSHAW, L. BROMBERG and A. RABINOVICH 809 Thermodynamic analysis of hydrogen production by partial oxidation reforming

A.L. Ahmad, M.R. Othman and H. Mukhtar 817 H_2 separation from binary gas mixture using coated alumina–titania membrane by sol–gel technique at high-temperature region

H.-M. Yeh 829 Optimum plate spacing for the best recovery of deuterium from water–isotopes mixture in flate-plate thermal-diffusion columns with total expense fixed

Lj. Vračar, N. Krstajić, S.G. Neophytides and J. Jakšić 835 Underpotential deposition of hydrogen on $MoPt_4$ intermetallic phase in acid solution: temperature dependence

Q. Li, K.-C. Chou, Q. Lin, L.-J. Jiang and F. Zhan 843 Hydrogen absorption and desorption kinetics of Ag–Mg–Ni alloys

R. Tang, Z. Zhang, L. Liu, Y. Liu, J. Zhu and G. Yu 851 Study on a low-cobalt $Ml_{0.8}Mg_{0.2}Ni_{3.2}Co_{0.3}Al_{0.3}$ alloy

H. Li and G.A. Karim 859 Knock in spark ignition hydrogen engines

C.K. Law and O.C. Kwon 867 Effects of hydrocarbon substitution on atmospheric hydrogen–air flame propagation

C.-Y. Seo 881 Microstructure and electrochemical properties of Zr–Ti–V–Ni–Mn–LM alloys for application in Ni–MH secondary battery

Y.L. Zhao, J.M. Wang, H. Chen, T. Pan, J.Q. Zhang and C.N. Cao 889 Al-substituted α-nickel hydroxide prepared by homogeneous precipitation method with urea

Announcements

897 Cancun Conference

898 Dubrovnik Conference

899 The First Cappadocia International Mechanical Engineering Symposium

900 ISMF'05

901 International Hyrogen Energy Congress and Exibition

902 Solar Hydrogen Energy

903 International Association for Hydrogen Energy

NUMBER 9

P.J. Sebastian 905 The opportunity for a sustainable hydrogen program in Mexico

E.L. Miller, R.E. Rocheleau and S. Khan 907 A hybrid multijunction photoelectrode for hydrogen production fabricated with

		amorphous silicon/germanium and iron oxide thin films
J. MOREIRA, P. DEL ANGEL, A.L. OCAMPO, P.J. SEBASTIÁN, J.A. MONTOYA and R.H. CASTELLANOS	915	Synthesis, characterization and application of a Pd/Vulcan and Pd/C catalyst in a PEM fuel cell
S. SILVA MARTÍNEZ, A. ALVAREZ GALLEGOS and E. MARTÍNEZ	921	Electrolytically generated silver and copper ions to treat cooling water: an environmentally friendly novel alternative
K. GURUNATHAN	933	Photocatalytic hydrogen production using transition metal ions-doped γ-Bi_2O_3 semiconductor particles
N.R. MATHEWS, E.L. MILLER, P.J. SEBASTIAN, M.M. HERNANDEZ, X. MATHEW and S.A. GAMBOA	941	Electrochemical characterization of a-SiC in different electrolytes
H.-M. JUNG, W.-Y. LEE, J.-S. PARK and C.-S. KIM	945	Numerical analysis of a polymer electrolyte fuel cell
F. FENG and D.O. NORTHWOOD	955	Effect of surface modification on the performance of negative electrodes in Ni/MH batteries
W.-Y. LEE, G.-G. PARK, T.-H. YANG, Y.-G. YOON and C.-S. KIM	961	Empirical modeling of polymer electrolyte membrane fuel cell performance using artificial neural networks
X. WANG, H. LUO, H. YANG, P.J. SEBASTIAN and S.A. GAMBOA	967	Oxygen catalytic evolution reaction on nickel hydroxide electrode modified by electroless cobalt coating
Announcements	973	For the establishment of United Nations Industrial Development Organization (UNIDO) International Centre for Hydrogen Energy Technologies (ICHET) Istanbul, Turkey
	975	Cancun Conference
	976	Dubrovnik Conference
	977	Sustainable Development of Energy, Water and Environment Systems
	978	SOLAR'05
	979	ISMF '05
	980	International Hyrogen Energy Congress and Exibition
	981	Solar Hydrogen Energy
	982	International Association for Hydrogen Energy
	983	International Association for Hydrogen Energy

NUMBER 10

H. Tsuchiya and O. Kobayashi	985	Mass production cost of PEM fuel cell by learning curve
A. Mills and S. Al-Hallaj	991	Simulation of hydrogen-based hybrid systems using Hybrid2
P. Pei, M. Ouyang, Q. Lu, H. Huang and X. Li	1001	Testing of an automotive fuel cell system
N. Rajalakshmi, T.T. Jayanth, R. Thangamuthu, G. Sasikumar, P. Sridhar and K.S. Dhathathreyan	1009	Water transport characteristics of polymer electrolyte membrane fuel cell
M.D. Mat, K. Aldas and O.J. Ilegbusi	1015	A two-phase flow model for hydrogen evolution in an electrochemical cell
Y.J. Leng, S.H. Chan, K.A. Khor and S.P. Jiang	1025	Performance evaluation of anode-supported solid oxide fuel cells with thin film YSZ electrolyte
D.-J. Liu, T.D. Kaun, H.-K. Liao and S. Ahmed	1035	Characterization of kilowatt-scale autothermal reformer for production of hydrogen from heavy hydrocarbons
T.A. Semelsberger, L.F. Brown, R.L. Borup and M.A. Inbody	1047	Equilibrium products from autothermal processes for generating hydrogen-rich fuel-cell feeds
S. Takenaka, T. Shimizu and K. Otsuka	1065	Complete removal of carbon monoxide in hydrogen-rich gas stream through methanation over supported metal catalysts
J. Sun, X. Qiu, F. Wu, W. Zhu, W. Wang and S. Hao	1075	Hydrogen from steam reforming of ethanol in low and middle temperature range for fuel cell application
Announcements		
	1083	For the establishment of United Nations Industrial Development Organization (UNIDO) International Centre for Hydrogen Energy Technologies (ICHET) Istanbul, Turkey
	1084	Cancun Conference
	1085	Dubrovnik Conference
	1086	Sustainable Development of Energy, Water and Environment Systems
	1087	International Association for Hydrogen Energy

NUMBER 11

D.S. SCOTT	1089	Fuelcells: chip of the future?
C.-J. WINTER	1095	The hydrogen energy economy: an address to the World Economic Forum 2004
M.A.K. LODHI	1099	Helio-hydro and helio-thermal production of hydrogen
Y.-K. OH, E.-H. SEOL, M.-S. KIM and S. PARK	1115	Photoproduction of hydrogen from acetate by a chemoheterotrophic bacterium *Rhodopseudomonas palustris* P4
S.K. KHANAL, W.-H. CHEN, L. LI and S. SUNG	1123	Biological hydrogen production: effects of pH and intermediate products
I.S. KIM, M.H. HWANG, N.J. JANG, S.H. HYUN and S.T. LEE	1133	Effect of low pH on the activity of hydrogen utilizing methanogen in bio-hydrogen process
L.M. RODRÍGUEZ-VALDEZ, I. ESTRADA-GUEL, F. ALMERAYA-CALDERÓN, M.A. NERI-FLORES, A. MARTÍNEZ-VILLAFAÑE and R. MARTÍNEZ-SÁNCHEZ	1141	Electrochemical performance of hydrogen evolution reaction of Ni–Mo electrodes obtained by mechanical alloying
G. SPAZZAFUMO	1147	Cogeneration of power and hydrogen with integrated fuel processor counterpressure steam cycles
A. SINGH, B.K. SINGH, D.J. DAVIDSON and O.N. SRIVASTAVA	1151	Studies on improvement of hydrogen storage capacity of AB_5 type:$MmNi_{4.6}Fe_{0.4}$ alloy
V.YA. DAVYDOV, N. SHEPPARD and E. OSAWA	1157	Reversible hydrogen chemisorption at near-ambient temperatures and pressures on unsaturated and aromatic hydrocarbon complexes with finely divided metals
W.-S. ZHANG, M.-Q. HOU, H.-Y. WANG and Y.-B. FU	1165	Numerical simulation of diffusivity of hydrogen in thin tubular metallic membranes affected by self-stresses
J.A. SCHOUTEN, J.P.J. MICHELS and R. JANSSEN-VAN ROSMALEN	1173	Effect of H_2-injection on the thermodynamic and transportation properties of natural gas
S. ALMOGREN and T.N. VEZIROGLU	1181	Solar-hydrogen energy system for Saudi Arabia
R.P. VISWANATH	1191	A patent for generation of electrolytic hydrogen by a cost effective and cheaper route
Announcements		
	1195	For the establishment of United Nations Industrial Development Organization (UNIDO)

International Centre for Hydrogen Energy Technologies (ICHET) Istanbul, Turkey

1196 Dubrovnik Conference

1197 Sustainable Development of Energy, Water and Environment Systems

1198 SOLAR'05

1199 International Hyrogen Energy Congress and Exibition

1200 Solar Hydrogen Energy

1201 International Association for Hydrogen Energy

NUMBER 12

D. SANBORN SCOTT 1203 Inside fuelcells

Y. KOJIMA, Y. KAWAI, M. KIMBARA, H. NAKANISHI and S. MATSUMOTO 1213 Hydrogen generation by hydrolysis reaction of lithium borohydride

R.C. DANTE, S. ARMENTA, M. GUTIÈRREZ and J. CELIS 1219 Temporal phenomena of hydrogen photobioproduction

A. KOGAN, M. KOGAN and S. BARAK 1227 Production of hydrogen and carbon by solar thermal methane splitting. II. Room temperature simulation tests of seeded solar reactor

A. DEMIRBAS 1237 Hydrogen-rich gas from fruit shells via supercritical water extraction

Q. JING, H. LOU, J. FEI, Z. HOU and X. ZHENG 1245 Syngas production from reforming of methane with CO_2 and O_2 over Ni/SrO–SiO_2 catalysts in a fluidized bed reactor

A. RODOLFO DOS SANTOS, R.C. AMBROSIO and E.A. TICIANELLI 1253 Electrochemical and structural studies on non-stoichiometric AB_2-type metal hydride alloys

M.-S. WU, H.-R. WU, Y.-Y. WANG and C.-C. WAN 1263 Electrochemical investigation of hydrogen-storage alloy electrode with duplex surface modification

C. ZHANG, X. LU and A. GU 1271 How to accurately determine the uptake of hydrogen in carbonaceous materials

R. KOTTENSTETTE and J. COTRELL 1277 Hydrogen storage in wind turbine towers

B. DEVI, A.S. BANTHIA and I.P. JAIN 1289 Effect of hydrogen on the conduction mechanism in $LaNi_5$ thin films

A.R. CHOUDHURI and S.R. GOLLAHALLI 1293 Intermediate radical concentrations in hydrogen–natural gas blended fuel jet flames

I. WIERZBA and A. DEPIAK 1303 Catalytic oxidation of lean homogeneous mixtures of hydrogen/hydrogen–methane in air

Announcements

1309 For the establishment of United Nations Industrial Development Organization (UNIDO) International Centre for Hydrogen Energy Technologies (ICHET) Istanbul, Turkey

1310 Dubrovnik Conference

1311 International Conference on Solid State Hydrogen Storage – Materials and Applications

1312 International Hyrogen Energy Congress and Exibition

1313 Solar Hydrogen Energy

1314 International Association for Hydrogen Energy

NUMBER 13

D.S. SCOTT 1317 Contrails Against An Azure Sky

N.H. AFGAN and M.G. CARVALHO 1327 Sustainability assessment of hydrogen energy systems

K. LEE, W.S. NAM and G. YOUNG HAN 1343 Photocatalytic water-splitting in alkaline solution using redox mediator. 1:Parameter study

Y. ANDO and T. TANAKA 1349 Proposal for a new system for simultaneous production of hydrogen and hydrogen peroxide by water electrolysis

H.-S. SHIN, J.-H. YOUN and S.-H. KIM 1355 Hydrogen production from food waste in anaerobic mesophilic and thermophilic acidogenesis

J.P. BINGUE, A.V. SAVELIEV and L.A. KENNEDY 1365 Optimization of hydrogen production by filtration combustion of methane by oxygen enrichment and depletion

E. FAKIOĞLU, Y. YÜRÜM and T. NEJAT VEZIROĞLU 1371 A review of hydrogen storage systems based on boron and its compounds

X.B. YU, J.Z. CHEN, Z. WU, B.J. XIA and N.X. XU 1377 Effect of Cr content on hydrogen storage properties for Ti-V-based BCC-phase alloys

Q. LI, K.-C. CHOU, Q. LIN, L.-J. JIANG and F. ZHAN 1383 Influence of the initial hydrogen pressure on the hydriding kinetics of the $Mg_{2-x}Al_xNi$ ($x = 0, 0.1$) alloys

H. WANG, L. OUYANG, M. ZENG and M. ZHU 1389 Microstructure and hydrogen sorption properties of Mg–Ni/MmM_5 multi-layer film by magnetron sputtering

Z. JUNBO, W. KUISHENG, S. HUITANG and W. SHAOBO 1393 Dynamic equations of impurity hydrogen during heavy water electrolysis

L. NOVAKOVIĆ 1397 Three-particle clusters and the cold-fusion problem

A. TSOLAKIS and A. MEGARITIS 1409 Catalytic exhaust gas fuel reforming for diesel engines—effects of water addition on hydrogen production and fuel conversion efficiency

Short Communication

YU.S. NECHAEV, D.V. IOURTCHENKO, J.G. HIRSCHBERG and T.N. VEZIROĞLU 1421 On the physics of hydrogen plastification and superplasticity of metallic materials and compounds

Letter to the editor

D.B. LEVIN 1425 Re: Biohydrogen Production: Prospects and Limitations to Practical Application—Erratum

D.J. GUNN and M.A. EL-BOUSIFFI 1427 Production of hydrogen-rich gases from steam reforming of methane in an automatic catalytic microreactor

M. LEVENT 1429 Re: "Production of hydrogen-rich gases from steam reforming of methane in an automatic catalytic microreactor" by M. Levent, D.J. Gunn and M.A. El-Bousiffi; International Journal of Hydrogen Energy, 28 (2003) 945–959

Announcements

1431 For the establishment of United Nations Industrial Development Organization (UNIDO) International Centre for Hydrogen Energy Technologies (ICHET) Istanbul, Turkey

1432 Dubrovnik Conference

1433 Sustainability Assessment of Hydrogen System

1434 France Deutschland Fuel Cell 2004

1435 3rd International Conference on Materials for Advanced Technologies (ICMAT) and 9th IUMRS-International Conference on Advanced Materials (ICAM)

1436 Solar Hydrogen Energy

1437 International Association for Hydrogen Energy

NUMBER 14

D.S. SCOTT	1439	"Until Something Better Comes Along!"
C. KORONEOS, A. DOMPROS, G. ROUMBAS and N. MOUSSIOPOULOS	1443	Life cycle assessment of hydrogen fuel production processes
S.Z. BAYKARA	1451	Hydrogen production by direct solar thermal decomposition of water, possibilities for improvement of process efficiency
S.Z. BAYKARA	1459	Experimental solar water thermolysis
R.B. SLIMANE, F.S. LAU, M. KHINKIS, J.P. BINGUE, A.V. SAVELIEV and L.A. KENNEDY	1471	Conversion of hydrogen sulfide to hydrogen by superadiabatic partial oxidation: thermodynamic consideration
C. COLLET, N. ADLER, J.-P. SCHWITZGUÉBEL and P. PÉRINGER	1479	Hydrogen production by *Clostridium thermolacticum* during continuous fermentation of lactose
A. SARKAR and R. BANERJEE	1487	A quantitative method for characterization of carbon nanotubes for hydrogen storage
S. FUKADA, S. MORIMITSU and N. SHIMOOZAKI	1493	Profiles of hydrogen molar fraction and temperature in $ZrV_{1.9}Fe_{0.1}$ alloy bed for hydrogen absorption
H.-P. KLEIN and M. GROLL	1503	Heat transfer characteristics of expanded graphite matrices in metal hydride beds
K.-I. TSUCHIYA	1513	Quantum states of deuterons in Pd
T. YARMAN	1521	Elucidation of the complete set of H_2 electronic states' vibrational data
S.O. AKANSU, Z. DULGER, N. KAHRAMAN and T.N. VEZIROĞLU	1527	Internal combustion engines fueled by natural gas—hydrogen mixtures
T. D'ANDREA, P.F. HENSHAW and D.S.-K. TING	1541	The addition of hydrogen to a gasoline-fuelled SI engine
Short Communication		
T. OHTA	1553	On the maximum $D^+ - D^+$ fusion rate by the implosion of cavitation bubble
V. LIPOVESTSKY	1555	Production of hydrogen, obtaining electric and thermal energy by water dissociation method
Announcements		
	1559	For the establishment of United Nations Industrial Development Organization (UNIDO) International Centre for Hydrogen Energy Technologies (ICHET) Istanbul, Turkey

1560 Sustainability Assessment of Hydrogen System

1561 France Deutschland Fuel Cell 2004

1562 ISES 2005 Solar World Congress

1563 Dubrovnik Conference

1564 ICAM2005

1565 International Hyrogen Energy Congress and Exibition

1566 Solar Hydrogen Energy

1567 International Association for Hydrogen Energy

NUMBER 15

D.S. Scott 1569 The Great Enemy Of Truth...

M. Santarelli, M. Calì and S. Macagno 1571 Design and analysis of stand-alone hydrogen energy systems with different renewable sources

C. Perkins and A.W. Weimer 1587 Likely near-term solar-thermal water splitting technologies

N.-L. Wu and M.-S. Lee 1601 Enhanced TiO_2 photocatalysis by Cu in hydrogen production from aqueous methanol solution

S.-H. Kim, S.-K. Han and H.-S. Shin 1607 Feasibility of biohydrogen production by anaerobic co-digestion of food waste and sewage sludge

L. Yong-Feng, D. Xin-Fa and L. Wei-Ming 1617 Effects of ZrO_2-promoter on catalytic performance of CuZnAlO catalysts for production of hydrogen by steam reforming of methanol

S. Gopalan and C. Hengdong 1623 Hydrogen separation through the use of mixed oxygen ion and electron conducting membranes (I): theoretical analysis

S.Z. Baykara 1631 Theoretical evaluation of diffusivity of hydrogen in palladium and rhodium

S.L. Isaack, E.A. Karakish, M. Soliman and E. El-Rafey 1637 A new approach to deal with the hysteresis phenomenon in hydride systems $TiFe_{1-x}M_x - H_2(M = Mn, Ni)$

L. Türker, I. Eroglu, M. Yücel and U. Gndz 1643 Hydrogen storage capability of carbon nanotube $Be@C_{120}$

Announcements

1649 Dubrovnik Conference

1650 ISES 2005 Solar World Congress

1651 UNIDO-ICHET

1652 Dubrovnik Conference 2005

1653 The 2005 H2U Design Contest

1654 1st International Summer School

1655 International Journal of Energy Research

1656 International Journal of Exergy

1657 International Green Energy Conference

1658 The 2nd International Exergy, Energy and Environment Symposium

1659 Hypothesis VI

1660 Clean Air 2005

1661 The Hydrogen Enrgy Transition

Volume Contents and Author Index for Volume 29 I

Instructions to Authors XXIX